Los Alamos
National Laboratory

TA-53 Facility Management
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TA-53 Procedure

Visitor Tours At TA-53

53FIR 406-300-01.0

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1.0 Introduction

As the Los Alamos Neutron Science Center (LANSCE) at TA-53 has grown in visibility, requests have increased commensurately for tours from groups including, but not limited to, the media, government officials, sponsors, academia, industry, and the public sector. Prior to this procedure, a process for tours where dosimetry is not required has been in place with requests made either directly to the LANSCE Visitor Center or handled by individual organizations and personnel on the mesa. It is intended to allow flexibility for all TA-53 tenants. Given common issues such as the waiver of dosimeter assignment and, for example, LANSCE Facility Management approval for tours including minors, all TA-53 tenants including those in non-LANSCE organizations, will follow this or an equivalent procedure.

2.0 Purpose

This procedure establishes guidelines that will permit more accurate recordkeeping and also allow a decentralized mechanism of conducting tours at TA-53 whether or not dosimetry is required. It also assures a dedicated, trained core group of tour guides and also supports educational outreach efforts. Tours can be tailored to meet the interests of the various individuals or groups requesting them, keeping in mind parameters such as beam status, radiological conditions, and area hazards. This procedure is to foster cross-communication between the TA-53 tenant organizations, the TA-53 hosts/guides, the LANSCE Facility Management (FM) team, the ESH-1 Radiological Control Technicians (RCTs), and the LANSCE Visitor Center.

3.0 Scope

This procedure applies to all tours given at TA-53. It documents the necessary forms and consideration of safety issues including hazard communication to tour participants along with tour guide responsibilities related to radiological hazards, postings, and emergency procedures.

4.0 Definitions

Guided Tour — a guided visit at TA-53 for the sole purpose of viewing activities at LANSCE and involving no work activities. Internal management walk-arounds associated with official Laboratory business are excluded from the definition of a tour.

Working Tour — a tour for personnel not meeting training requirements and who have established or are establishing a working relationship with LANSCE for the purpose of expanding their knowledge so as to further the working relationship.

High Radiation Area — an area where one could receive 100 mrem or more in any one hour while standing at 30 cm either from the source of radiation or the shield wall through which the radiation is penetrating, but less than 500 rads in one hour at 100 cm from the source or wall.

TA-53 Tour Host — the first point of contact for a tour request; upon occasion, one may serve as both tour host and guide.

TA-53 Tour Guide — a person current in TA-53 facility-specific training and appropriate radiological training who assumes responsibility for the safety of a visitor while conducting a tour at TA-53.

Minor — anyone under the age of 18.

5.0 Responsibilities

If you are...	You Will...
Tour Host	• contact the LANSCE Visitor Center (7-7396) to make necessary arrangements **OR** • query a Radiological Control Technician at ESH-1 (7-7069/7-5890) a minimum of 48 hours in advance if the possibility exists of entering potential high radiation/contamination areas • query a Radiological Control Technician at ESH-1 (7-7069/7-5890) a minimum of one week in advance if minors are being toured, obtain the approval of the Facility Manager, and notify affected tenant organization/s • get confirmation a minimum of 48 hours in advance from the tenant organization/s that all areas to be toured are safe for the tour • determine the necessity/type of dosimeters to be issued, consulting ESH-1 if needed • provide the required information for any non-badged visitors including their name, date of visit, organization, and phone number of host (reference 53 FMP 106-02.03 Facility Access Control) to the TA-53 gate attendants and verify tour participant citizenship (reference 53 FMP 123-01.1 Foreign Visitor Check-In) • maintain a record of tours conducted, using the TA-53 Tour Log (see Attachment 1), and mail the completed, signed log to the LANSCE Visitor Center at MS H831

Member of the LANSCE Visitor Center Staff Asked to Organize a Tour	• query a Radiological Staff Member at ESH-1 (7-7069/7-5890) a minimum of 48 hours in advance if the possibility exists of entering potential high radiation/contamination areas • query a Radiological Staff Member at ESH-1 (7-7069/7-5890) a minimum of one week in advance if minors are being toured, obtain the approval of the Facility Manager, and notify affected tenant organization/s • get confirmation a minimum of 48 hours in advance from the tenant organization/s that all areas to be toured are safe for the tour • determine the necessity/type of dosimeters to be issued, consulting ESH-1 if needed • provide the required information for any non-badged visitors including their name, date of visit, organization, and phone number of host (reference 53 FMP 106-02.03 Facility Access Control) to the TA-53 gate attendants and verify tour participant citizenship (reference 53 FMP 123-01.1 Foreign Visitor Check-In) • maintain a record of tours conducted, using the TA-53 Tour Log (see Attachment 1)
Radiological Control Technician (RCT)	• post radiological areas to identify the radiological hazards • provide appropriate supplemental dosimeters when required
LANSCE Visitor Tour Guide	• have current TA-53 facility-specific training (including Limited Access or Restricted Access Area training if necessary), appropriate radiological training, and training specific for the areas to be toured • ensure the appropriate arrangements have been made by the LANSCE Visitor Center and/or the TA-53 tour host including confirmation that the tenant organization/s have deemed that areas to be toured are safe for the tour • ensure tour participants are issued TLD dosimeters at the LANSCE Visitor Center, LANSCE-FM, Lujan Center, or ESH-1 if necessary or requested • brief participants using the TA-53 Briefing Card (see Attachment 2) • complete the TA-53 Tour Log (see Attachment 1), obtain tour participant signatures, and mail the Tour Log to the LANSCE Visitor Center at Mail Stop H831
Accompanying Working Personnel at LANSCE	• have current TA-53 facility-specific training (including Limited Access or Restricted Access Area training if necessary), appropriate radiological training, and training specific for the areas to be toured

	• determine the necessity/type of dosimeters to be issued, consulting ESH-1 if needed • ensure that the tenant organization/s have deemed that areas to be toured are safe for the tour • ensure tour participants are issued TLD dosimeters at the LANSCE Visitor Center, LANSCE-FM, Lujan Center, or ESH–1 if necessary or requested • brief participants using the TA-53 Briefing Card (see Attachment 2) • complete the TA-53 Tour Log (see Attachment 1), obtain tour participant signatures, and mail the Tour Log to the LANSCE Visitor Center at Mail Stop H831
Hosting a Visitor Tour to a High Radiation / Contamination Area	• obtain approval a minimum of 48 hours in advance from the line management and site/program/project management of the tenant organization/s (to be followed up with ESH-1 and TA-53 FM concurrence) • verify that the tour group includes official visitors only (i.e., Laboratory program sponsor) and assure a group size (five people maximum) that allows control of the visitors' movements; assure that no minors are included • inform each member of the tour group that a measurable radiation dose is likely to be incurred • query a Radiological Control Technician at ESH-1 (7-7069/7-5890) a minimum of 24 hours in advance of the tour including a determination of the number of devices to be prepared and issued [individual visitor TLD badges and electronic personal dosimetry (EPD) devices] and enlisting an RCT to accompany the tour who will serve as an on-the-spot monitor and as low as reasonably achievable (ALARA) radiation dose advisor/consultant; the maximum dose to any individual as indicted by the EPD shall not exceed 20 mrem during the tour (20 percent of the annual allowed dose to a member of the general public) • provide the required information for any non-badged visitors including their name, date of visit, organization, and phone number of host (reference 53 FMP 106-02.03 Facility Access Control) to the TA-53 gate attendants and verify tour participant citizenship (reference 53 FMP 123-01.1 Foreign Visitor Check-In)
Tour Guide at a High Radiation / Contamination Area	• have current TA-53 facility-specific training (including Limited Access or Restricted Access Area training if necessary), Radiation Worker II training, and training specific for the areas to be toured • ensure the appropriate arrangements have been made by the

	LANSCE Visitor Center and/or the TA-53 tour host including confirmation that the tenant organization/s and ESH-1 have deemed that areas to be toured are safe for the tour • ensure tour participants are issued individual visitor TLD badges and electronic personal dosimetry (EPD) devices by ESH-1 • brief participants using the TA-53 Briefing Card (see Attachment 2) • be familiar with the radiation environment and hazards to be expected in the areas visited and exercise all reasonable efforts to minimize the doses received • notify a Radiological Control Technician (7-7069/7-5890) to accompany the tour • complete the TA-53 Tour Log (see Attachment 1), obtain tour participant signatures, and mail the Tour Log to the LANSCE Visitor Center at Mail Stop H831
Radiological Control Technician Accompanying a Visitor Tour at a High Radiation / Contamination Area	• be familiar with the radiation environment and hazards to be expected in the areas visited; provide on-the-spot radiation monitoring and health and safety consultation • know and exercise ALARA principles at all times during the conduct of the tour • at the conclusion of the tour, collect the TLD and supplemental badges and record the EPD readings for each tour member; a copy of the dosimetry results may be provided to the tour leader
Tour Participant	• be briefed regarding potential hazards and sign the TA-53 Tour Log indicating same • if deemed necessary, be issued TLD badges/electronic personal dosimetry (EPD) devices • if a dosimetry badge is not required, you may elect to have one issued • upon request, receive the TA-53 Radiation Protection pamphlet • return any dosimetry or identification badges/devices issued at TA-53 upon completion of the tour

6.0 Precautions and Limitations for: Tours Including Minors, Tours in High/Very High Radiation/Contamination Areas, Airborne Radioactivity Areas

Site tours for minors require a minimum of one-week advance notification to the LANSCE Facility Manager and the affected tenant organization/s. Send the Facility Management Office (LANSCE-FM) and the tenant organization/s documentation indicating all areas to be toured, any scheduled special activities, and a list of all tour participants including full name and date of birth. LANSCE-FM and the affected tenant organization/s will grant/deny approval and communicate this information to the TA-53 hosts/guides, ESH-1, and the LANSCE Visitor Center.

The usual requirements for entry or work in high radiation areas include additional personnel dosimetry devices for each person, the work to be controlled by a Radiation Work Permit (RWP), and appropriate radiation worker training for each person. Therefore, tours of such areas should be conducted only under special circumstances and with the approval of the TA-53 FM Office (the DOE dose limit for total effective dose equivalent to visitors and members of the public is 100 mrem in one year). For instance, it may be desirable to allow visitors entry to a high radiation area under strict controls with the caveat of mutual benefit to the visitor (sponsor of a Laboratory program) and to the Laboratory. In such cases, the benefit can be construed to offset the potential for any health detriment from the increment of personnel radiation exposure that could be received by the visitor. ALARA concepts must be carefully considered and included in planning and executing the tour. Minors are not permitted.

Tour visitors shall not be taken into very high radiation/contamination areas nor into "particulate" airborne radioactivity areas. On a case-by-case basis and with the approval of the TA-53 FM Office, tour visitors may be allowed into radiological areas controlled for contamination or "gaseous" airborne radioactivity areas. Minors are not permitted.

7.0 Procedural Steps

7.1 Tours within TA-53 are arranged either through the LANSCE Visitor Center or by a TA-53 tour host in concert with fully trained tour guides as defined in section 5 above.

7.2 Determination is made whether minors and foreign nationals are tour participants and consequent approvals arranged: for minors (through LANSCE-FM and the tenant organization/s) and for foreign nationals (through S-6 and the tenant organization/s), bearing in mind that it is the host and line management responsibility to prohibit access by foreign nationals to areas where classified experiments are being conducted.

7.3 Potential hazards including radiological hazards are addressed in advance of actual tour scheduling.

7.4 Complete full-loop and closure communication between the TA-53 tour hosts/guides, ESH-1, LANSCE-FM, affected tenant organization/s of tour areas, TA-53 tour guides, and the LANSCE Visitor Center on all required aspects of tour procedures.

7.5 Ensure tour participants are issued TLD dosimeters at the LANSCE Visitor Center, LANSCE-FM, Lujan Center, or ESH-1 if necessary or requested. Supplemental Electronic Pocket Dosimeters (EPDs) are issued by ESH-1. Tour guides should strongly consider wearing an EPD.

8.0 Required Records

The LANSCE Visitor Center shall retain all TA-53 Tour Log forms completed and signed by tour guides acknowledging (by signature of tour participants) the briefing on potential hazards. These records will also include, if applicable, requests to LANSCE-FM and affected tenant organization/s for tours by minors and consequent approval/denial. TA-53 Tour Log forms will be retained for five years from date of tour.

9.0 References

53 FMP 106-02.3 (TA-53 Procedure, Facility Access Control)
53 FMP 123-01.1 (TA-53 Procedure, Foreign Visitor Check-In)
53 FMS 113-01.0 (TA-53 Standard, Facility-Specific Training)
LANL AM 616, Visitors
10 CFR 385, Radiation Protection for the Occupational Worker
LIR 402-702-01, ALARA
LIR 402-706-01, Personnel Dosimetry
LIR 402-712-01, Radiological Posting
LIR 402-718-01, Radiological Training
LPR 402-703.0, Area Designations
LPR 402-704.0, Contamination Control

10.0 Attachments

Attachment 1, LANSCE TA-53 Tour Log
Attachment 2, Hazard Communication for LANSCE Tours (briefing card)
Attachment 3, TA-53 Radiation Protection Pamphlet

TA-53 TOUR LOG

(Send completed form to MS H831)

_____

Tour Date & Approximate Duration

LOCATIONS VISITED: (Check all applicable; list others not shown. Locations marked with an * are potentially high radiation/contamination areas. Prior approval must be obtained according to Sections 5 & 6 of TA-53 Controlled Document 53 FMP 406-300-01.0 Visitor Tours at TA-53.)

Linac:

- ❒ Injectors – Sector J (MPF-3J)
- ❒ Beam tunnels (MPF-3 A-H; Line D*)
- ❒ Equipment rooms and aisles (MPF-3)
- ❒ Control room (MPF-4)
- ❒ Switchyard*

Proton Storage Ring:

- ❒ Ring Equipment Building* (MPF-28)
- ❒ Tunnel* (MPF-8)

Experimental Area:

- ❒ Lujan Center, ER-1 (MPF-7)
- ❒ Lujan Center, ER-2 (MPF-30)
- ❒ WNR Blue Room* (MPF-7)
- ❒ Area A & A-East* (MPF-3M)
- ❒ Areas B & C* (MPF-3N & P)

Laboratories:

- ❒ AFEL/SPA (MPF-14)
- ❒ CRITS*/Banshee (MPF-18)
- ❒ LEDA (MPF-365)
- ❒ ETL (MPF-2)
- ❒ Structures Lab (MPF-17)

❒ Other area(s) with radiation or industrial hazards: (list)

CHECK ONE:

❒ Based on the stated itinerary, I have determined tour participants are not likely to exceed a dose of 50 mrem, and radiation dosimetry is not required. I have informed tour participants of potential hazards that exist as per the Tour Briefing Card and made the *TA-53 Radiation Protection* pamphlet available upon participant request.

❒ Based on the stated itinerary, I have determined the possibility exists of a dosage greater than 50 mrem, and the requisite individual dosimeters have been issued.

_____ _____

Tour Guide Signature Organization and Phone Number

List of Tour Participants

*If academic institution, please check appropriate box. Attach additional sheets as needed.

Print Name	Signature	Institution	*
			❒ Student ❒ Staff
			❒ Student ❒ Staff
			❒ Student ❒ Staff
			❒ Student ❒ Staff
			❒ Student ❒ Staff
			❒ Student ❒ Staff
			❒ Student ❒ Staff
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			❒ Student ❒ Staff

Summary *(for LANSCE Visitor Center use only)*

❒ # Academia ❒ # DOE Lab ❒ # Industry ❒ Lujan

❒ # Students ❒ # US Gov't ❒ # Other

LANSCE Tour Briefing Card

Tour Guides: Please address the following topics with your tour group prior to conducting the tour.

TOUR RULES:

- Stay with tour guide at all times.
- Do not touch equipment unless cleared by guide or responsible person.
- Follow emergency instructions.
- If TLDs have been issued, return them at the end of the tour.
- Sign tour log.

HAZARDS at LANSCE: (for more specific information, contact the LANSCE Training Office)
Industrial

- Maintain a safe distance from forklifts and cranes.
- Personal protective equipment is required in certain areas (shops, construction areas, crane areas, high noise areas).
- Observe signs and barriers.

Radiation: Radiation is the collective term for the particles or waves of energy emitted by natural and man-made sources. LANSCE has several particle beam accelerating facilities that produce ionizing radiation. Ionizing radiation loses energy when it passes through a medium and interacts with constituent atoms and molecules. Biological effects of radiation are induced by the absorption of energy in tissues. Most of the radiation energy is absorbed in the water content of the body and may result in chemical changes. In high enough doses, radiation can cause wide-ranging effects. There are additional risks associated with prenatal radiation exposure.

- You are not expected to receive significant radiation exposure on this tour; however, if you wish, you may request a dosimeter which is designed to measure radiation dosage.

OR

- The dosimeter you have been issued is designed to record any measurable exposure you may receive while on site.

AND

- The *TA-53 Radiation Protection* pamphlet explaining potential radiological hazards in more detail is available upon request.

POSTINGS:

- Radiological areas are posted with entry and exit requirements.
- Follow guide's instructions for any specifics when entering or leaving these areas.

EMERGENCIES:

- Stay with tour group.
- Follow guide's instructions.
- Remain at muster area with your guide until you are released.

TA-53 RADIATION PROTECTION

• Policies and Responsibilities

Radiation is the collective term for the particles or waves of energy emitted by natural and man-made systems. Radiation can be ionizing radiation or nonionizing. Ionizing radiation is produced at TA-53 by several particle beam accelerating facilities. Ionizing radiation can cause chemical changes in the body. This brochure addresses radiation protection with regard to ionizing radiation. Examples of nonionizing radiation are microwaves and television waves.

Both the Laboratory and the Department of Energy work to keep radiation exposure as low as reasonably achievable (ALARA). The goal of ALARA is to keep exposure to ionizing radiation as low a level as is socially, technically, and economically practical.

Laboratory managers must ensure that radiation doses to employees, visitors, and the public are kept ALARA. Employees and visitors must obey posted signs and instructions in controlled and radiological areas; receive training appropriate to their job assignments; and inform supervisors of radiation hazards of potential problems.

• Radiation Dosimetry

Your tour guide or escort will wear a dosimetry badge to measure any radiation exposure while you are on site. Please stay with your tour guide.

If you are issued a dosimetry badge, you must wear it at all times when on site.

• Risks of Occupational Radiation Exposure

Risks from occupational radiation exposure depend on
- the amount of radiation received (radiation dose)
- the period of time over which the dose is received
- the area of the body that receives the dose.

Somatic Effects- These effects will take place in the body of the person who has been exposed. Ionizing radiation can change body cells, resulting in illnesses, including cancer. The risk of developing an illness is proportional to the amount of radiation dose received.

Genetic Effects- Effects may show up in the offspring of a person exposed to radiation doses.

• Risks of Prenatal Radiation Exposure

In high enough doses, radiation can cause effects that range from deformation of the fetus to an apparent increased susceptibility to certain diseases. The most radiosensitive periods are from 8 to 15 weeks, and to a lesser extent from 16 to 25 weeks of gestational age. Exposure of the fetus to large

doses of radiation during this period of development can result in mental retardation, small headsize, and an increased risk of cancer.

• Emergency Procedures

Call 911

- Follow your host's instruction and stay with your host all times
- Emergency Evacuation Posters may be found throughout the Laboratory and will provide evacuation routes, assembly areas, and emergency phone numbers.

Alarms

- There are many different types of alarms used at TA-53. If you hear any alarm, immediately evacuate the building and go to the assembly area. Stay with your host and remain there until all people have been accounted for.

First Aid

- Visitors should report to the Los Alamos Medical Center for medical treatment.
- For Emergencies, call 911. In the event of a major medical emergency, call an ambulance by dialing 911 or go directly to Los Alamos Medical Center.

Fires

- Secure your safety first
- Call 911
- Report to the designated assembly area
- **Do not attempt to fight the fire**

• Postings

There are many types of postings that you may encounter at TA-53. Be sure to read all signs and follow all directions or precautions that must be taken before entering. These precautions are usually indicated on the lower portion of the sign:

- the dose rate or contamination level and
- required protective clothing, training or dosimetry

- **TA-53 Health Physics**

ESH-1 Section Office	7-5890
Radiological Control Technicians	7-7069
LANSCE Training Office	5-6256

- **Emergency - call 911**

Emergency Management Office	7-6211
Protective Force	7-4437